UNITED STATES PATENT AND TRADEMARK OFFICE

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10/714,179	11/14/2003	Stefano Cervini	03-LJ-064	9391

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EXAMINER
KAWSAR, ABDULLAH AL

ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>23 March 2010</u>.
2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-7,9-21 and 23-28</u> is/are pending in the application.
　　4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) <u>1-7,9-21 and 23-28</u> is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on <u>14 November 2003</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.
　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
　　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
　　a)☐ All   b)☐ Some * c)☐ None of:
　　　1.☐ Certified copies of the priority documents have been received.
　　　2.☐ Certified copies of the priority documents have been received in Application No. _____.
　　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
　　* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)
1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO/SB/08)
　　Paper No(s)/Mail Date _____.
4)☐ Interview Summary (PTO-413)
　　Paper No(s)/Mail Date. _____.
5)☐ Notice of Informal Patent Application
6)☐ Other: _____.

DETAILED ACTION

1.   Claims 1-7, 9-21 and 23-28 are pending.

Continued Examination Under 37 CFR 1.114

2.   A request for continued examination under 37 CFR 1.114, including the fee set forth in

37 CFR 1.17(e), was filed in this application after final rejection. Since this application is

eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e)

has been timely paid, the finality of the previous Office action has been withdrawn pursuant to

37 CFR 1.114. Applicant's submission filed on 3/23/2010 has been entered.

Claim Objections

3.   Claim 1 is objected to because of the following informalities:

a.   Line 7 remove repeated word "on".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the
> subject matter which the applicant regards as his invention.

4.   Claims 1-7, 9-21 and 23-28 rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.

b.   The following claim languages are not clearly understood and indefinite:

      i.   Claim 1, line 7 recites "dynamically bundle a subset of said plurality of

jobs... said comparison" it is unclear what constitutes the job comparison with the

status (i.e. comparing between job status for what? jobs with similar status value?

different status value? how are the jobs bundled?).

      ii.   Claim 15, lines 1-3 recites "executing at least one single program multiple

data(SPDM) program, for use with a micro single multiple data(SIMD) unit" but

in line 11, recites "allocating task to said micro SIMD unit" it is unclear if the

SIMD unit is a intended use of the method or positively requires the SIMD unit to

perform the steps of the method claim. Applicant is required to amend the claim

to positively recite the SIMD unit required to perform the steps of the method.

      iii.   Claim 2, line 2 recites "capable of" which is indefinite and does not

positively recite that the system will perform the function, as being capable of

doing a certain function does not mandate the system to perform the function.

Claim Rejections - 35 USC § 103

      The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

5.   Claims 1, 3, 6-7, 9-10, 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Wilkinson et al.(Wilkinson) US Patent no. 6094715, in view of Lorie et al.(Lorie) US

Patent No. 4435758.

6.   As per claim 1, Wilkinson teaches the invention substantially as claimed including an

apparatus for executing at least one single multiple data(SPMD) program in a microprocessor,

said apparatus comprising:

a micro single instruction multiple data (SIMD) unit associated with a microprocessor

(col 7, lines 25-27); and

a job buffer(BCI buffer) having an output coupled to an input of said SIMD unit(PME)

(col 24, lines 49-55; col 75, lines 1-4), said job status comprising a program counter value and a

loop-counter list, and wherein a job is a combination of program and an input data-set (col 24,

lines 9-17; lines 34-47; col 33, lines 51-65 through col 34, lines 1-7; par. 26, lines 6-21; col 29,

lines 44-52; col 39, lines 60-65; col 27, lines 6-21).

Wilkinson does not specifically disclose the said job status comprises loop-counter list.

It would have been obvious to a person in ordinary skill in the art at the time of the

invention to have a loop count list as status of a task as it is well know variable and used to

define the number a iteration a program needs to confirm the instruction execution is complete

and also gives the system ability to resume/restart from the same position after a context switch.

Wilkinson does not specifically disclose wherein said job buffer is configured to: at

runtime, compare a job status of a plurality of jobs; dynamically bundle a subset of said plurality

of jobs into a task based on said comparison; and allocates said task to said micro SIMD unit.

However, Lorie teaches wherein said job buffer is configured to: at runtime, compare a

job status of a plurality of jobs; dynamically bundle a subset of said plurality of jobs into a task

based on said comparison; and allocates said task to said micro SIMD unit (col 1, lines 32-45;

col 2, lines 43-51; col 6, lines 21-54; col 5, lines 9-24).

7.   It would have been obvious to a person of ordinary skill in art at the time of invention

was made to incorporate the teaching of Lorie into method of Wilkinson to dynamically bundle

the similar jobs into a task for execution on a SIMD unit. The modification would have been

obvious because one of the ordinary skills of the art would bundle the similar tasks together and

allocate them to a SIMD unit to minimize the inter-processor communication.

8.   As per claim 3, Wilkinson teaches said at least one SPMD program comprises a plurality

of input data streams having moderate diversification of control flows (col 8, lines 25-29).

9.   As per claim 6, Wilkinson teaches said apparatus executes a plurality of SPMD programs

and wherein each SPMD program of said plurality of SPMD programs is executed on a number

of input data streams (col 8, lines 19-2).

10.   As per claim 7, Wilkinson teaches said number of input data streams is greater than a

program granularity threshold (col 41, lines 24-36).

11.   As per claim 9, Lorie teaches said apparatus performs job clustering to form a job bundle

in which each job in said job bundle has an equivalent control flow (col 1, lines 32-45).

12.   As per claim 10, Lorie teaches said apparatus performs said job clustering based on a job

processing status of said jobs in said job bundle (col 1, lines 32-49; col 6, lines 21-54).

13.   As per claim 13, Lorie teaches said apparatus maximizes a size of a job cluster by

selecting tasks for execution in which a job processing status of each of said tasks is complete

(col 8, lines 51-67).

14.   As per claim 14, Wilkinson teaches said apparatus executes a data loading phase for a

task before said apparatus executes a task execution phase for said task (col 24, lines 2-8; lines

17-26).

15.   Claims 4, 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilkinson et

al.(Wilkinson) US Patent no. 6094715, in view of Lorie et al.(Lorie) US Patent No. 4435758, as

applied to claims 1 above, and in view of Pechanek et al. US Patent No. 6,470,441 B1.

16.   As per claim 4, Wilkinson and Lorie do not specifically discloses apparatus executes said

at least one SPMD program once for each input data stream of said plurality of input data

streams.

        However, Pechanek teaches said apparatus executes said at least one SPMD program

once for each input data stream of said plurality of input data streams (col 4, lines 62-65).

17.   It would have been obvious to a person of ordinary skill in art at the time of invention

was made to incorporate the teaching of Pechanek into combined method of Wilkinson and Lorie

to execute SPMD once for each data stream. The modification would have been obvious because

one of the ordinary skills of the art would have a SPMD program execution once for each data input stream as it would reduce the latency of process execution.

18.   As per claim 5, Wilkinson teaches said apparatus generates an instruction stream for each input data stream of said plurality of input data streams (col 8, lines 25-28).

19.   Claims 11, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilkinson et al.(Wilkinson) US Patent no. 6094715, in view of Lorie et al.(Lorie) US Patent No. 4435758, as applied to claim 1 above, and further in view of "Multi-thread VLIW processor architecture for HDTV decoding" by Hansoo Kim(Kim).

20.   As per claim 11, Wilkinson and Lorie do not specifically disclose forces a task to terminate at a point where a job control path might fork by placing a code-stop.

    However, Kim teaches said apparatus forces a task to terminate at a point where a job control path might fork by placing a code-stop in said task (page 3, col 1, lines 3-8, "the program can ………… entries exceeds a predefined number.")

21.   Therefore, it would have been obvious to a person of ordinary skill in art at the time of invention was made to incorporate the teaching of Kim into the combined method of Wilkinson and Lorie to have a task termination point to switch task. The modification would have been obvious because one of the ordinary skills of the art would have a task switch to fulfill special conditions of system execution and prioritize execution.

22.   As per claim 12, Kim teaches said apparatus minimizes a required number of code-stops

to be placed in said task by excluding from code-stop placement each control flow statements

that is equivalent to a select instruction (page 3, col 1, lines 3-8, "the program can ………..

exceeds a predefined number.").

Allowable Subject Matter

23.   Claims 2 would be allowable if rewritten to overcome the rejection(s) under 35

U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of

the base claim and any intervening claims.

24.   Claim 15 would be allowable if rewritten or amended to overcome the rejection(s) under

35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

Response to Amendment

25.   Examiner has tried to contact applicant's representative repeatedly to resolve the 112

issues and expedite the prosecution of the application but was unable to receive any response

from applicant's representative.

Response to Arguments

26.   Applicant's arguments with respect to claim(s) have been considered but are moot in view

of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ABDULLAH AL KAWSAR whose telephone number is (571)270-3169. The examiner can normally be reached on 7:30am to 5:00pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng Ai T. An can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Abdullah-Al Kawsar/
Examiner, Art Unit 2195

/Li B. Zhen/
Primary Examiner, Art Unit 2194